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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/829,148	04/20/2004	Roger J. Malik	690-002	5092

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Ward & Olivo
708 Third Avenue
New York, NY 10017

EXAMINER

BUEKER, RICHARD R

ART UNIT	PAPER NUMBER
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1763

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/829,148

Applicant(s)

MALIK, ROGER J.

Examiner

Richard Bueker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-152 is/are pending in the application.
- 4a) Of the above claim(s) 5-7,25,32-39,60-62,84-91,114 and 136-143 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 8-24, 26-31, 40-59,63-83, 92-113, 115-135 and 144-152 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Claims 8, 66 and 120 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 8, 66 and 120 the phrase "concentric configuration" is vague and indefinite because it fails to indicate what the part is concentric with respect to or relative to. Applicant has argued that the specification "concentric configuration" is sufficiently disclosed in the specification. It is noted, however, that the rejection is not directed at the specification. The rejection is under 35 U.S.C. 112, second paragraph, because the scope of each of claims 8, 66 and 120 as written is unclear.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 8-20, 29-31, 40-53, 55, 66-82, 92-107, 109, 115, 116, 118-135 and 144-152 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarraf (5,558,720) taken in view of Zega (4,112,137), De Lange (2,508,500) and Dale (3,634,647), and in further view of Bennet (2,568,578) and Mercer (5,407,000).

Sarraf (see the Fig.) discloses a liquid metal evaporation source for use in MBE process. Sarraf teaches (col. 1, lines 42-45) that MBE evaporators are limited by source depletion. Sarraf solves this problem by providing a heated supply tank of liquid metal melt along with a feed pipe for continuously replenishing the evaporator. Sarraf uses a capillary wick to pump (see col. 2, lines 30-32) the liquid metal to the evaporator,

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and he doesn't discuss the use of a piston to push the liquid metal out of the supply tank. Zega (see Fig. 2, for example), De Lange (see Figs. 2 and 3, for example) and Dale (see Fig. 5, for example) all also disclose vaporizers of the type that are continuously supplied with liquid metal from a heated supply tank by pushing the liquid into the feed pipe. Zega teaches (see paragraph bridging cols. 6 and 7) that this type of recharging system can be applied to feeding any source of evaporation of relatively low melting point. Therefore, it would have been obvious to use this type of continuous supply for an MBE vaporizer of the type disclosed by Sarraf. Also, Zega and De Lange teach that such a supply system should be provided with a separate heater on the feed pipe. Also, De Lange (see element 11 of Fig. 2) and Dale (see col. 7, lines 14-19) teach that a piston in the supply tank can be used to push the liquid metal from the supply tank into the feed tube. It would have been obvious to use a separately heated feed tube and a piston to continuously supply an MBE evaporator of the type disclosed by Sarraf, because the secondary references teach that these expedients can successfully be used to continuously supply an evaporator as desired by Sarraf. Also, Bennet (see Fig. 1, for example) and Mercer (see Fig. 1, for example) teach that a molten metal supply pipe should be provided with its own heater and thermocouple based heater control means, to make sure that the pipe is kept within a temperature range in which it will not become cool enough for the metal to solidify, and also will not become too hot (see Bennet at col. 1, lines 23-27, for example). It would have been obvious to one skilled in the art to provide the molten metal supply pipe of Sarraf, Zega, De Lange and Dale with its own heater and heater control, for the desirable purpose of preventing both

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solidification and local over-heating, as taught by Bennet and Mercer. Regarding the use of a conducting probe to sense the level of liquid in the evaporator, De Lange (see Fig. 1 and col. 4, lines 38-44) teaches this type of level sensor for sensing the level in an evaporator. De Lange also teaches (col. 4, lines 55-60) that this type of level sensor can be used to control the movement of a piston feeder of the type shown in De Lange's Fig. 2. It would have been obvious to use this type of prior art liquid level sensor to control the liquid level in any of the prior art evaporators described in the cited references. It is noted also that claim 1 for example does not positively recite the conducting probe as part of the claimed apparatus, but instead refers to the conducting probe in terms of a process limitation (i.e. "wherein at least one conducting probe is used") which is only a recitation of intended use that does not so limit the claimed apparatus combination. The same is true for the description of intended use that follows the phrase "can be used" in line 11 of claim 1. The elements referred to there are not part of the claimed apparatus. Regarding the use of graphite (which is a refractory material) as recited in claim 3, Zega (col. 8, line 17) teaches that this is a material that can successfully be used for vapor sources. Also, any particular temperature or relative temperature recited in the present apparatus claims represents a recitation of intended use of the claimed apparatus and does not so limit the apparatus claims. Also, the use of flanges to connect machine parts along with nuts, bolts or champs would have been obvious to one of ordinary skill in the mechanical arts.

Claims 4, 29-31, 51-54, 81-83, 99, 105-108 and 133-135 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarraf (5,558,720) taken in view of Zega

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(4,112,137), De Lange (2,508,500) and Dale (3,634,647) and in further view of Bennet (2,568,578) and Mercer (5,407,000) for the reasons stated above, and taken in further view of Chow (5,031,229) (see Fig. 1, for example) who teaches the use of pyrolytic graphite to form the heater elements on the outer surface of an evaporator. It would have been obvious to one skilled in the art to use the pyrolytic graphite heater of Chow as the heater 18 of Sarraf because Chow teaches that his heater provides a more uniform temperature.

Claims 21-24, 26, 27, 56-59 and 110-113 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarraf (5,558,720) taken in view of Zega (4,112,137), De Lange (2,508,500) and Dale (3,634,647) and in further view of Bennet (2,568,578) and Mercer (5,407,000), and taken in further view of Bahney (2,195,071) who teaches (see paragraph bridging pages 4 and 5) that a probe for detecting molten metal liquid level desirably should be provided with a ceramic insulation coating, and he also teaches that the probe can be constructed of graphite, and it would have been obvious to incorporate these suggestions into the liquid level sensor suggested by De Lange.

Claims 28, 63-65, 116 and 117 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sarraf (5,558,720) taken in view of Zega (4,112,137), De Lange (2,508,500) and Dale (3,634,647) and in further view of Bennet (2,568,578) and Mercer (5,407,000) and in further view of Bahney (2,195,071) for the reasons stated in the rejection above, and taken in further view of Komiyama (JP 53-019135), who teaches that a molten metal liquid level probe desirably can make electrical contact with a molten metal through the surface of the metal and through conductive walls of the

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molten metal container, and it would have been obvious to incorporate these suggestions into a liquid level sensor of the type suggested by De Lange.

Applicant's arguments with respect to Sarraf have been considered but are not convincing, because applicant has attacked the primary reference individually where the rejections are based on a combination of references. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 208 USPQ 871; *In re Merck & Co.*, 231 USPQ 375.

Applicant's argument with respect to Zega is in effect that Zega is non-analogous art and therefore the teachings of Zega cannot be combined with the teachings of Sarraf. It is noted, however, that analogous art is all art in the field of endeavor, plus those arts which are reasonably pertinent to the particular problem solved by the invention. See *In re Pagliaro*, 210 USPQ 888 and *In re Oetiker*, 24 USPQ2d 1443. In this case, Zega is at the least from an art reasonably pertinent to the problem of supplying liquid metal to an evaporation source.

Applicant has argued that each of Sarraf, Zega, De Lange and Dale individually does not teach the use of three separate heaters to control three distinct temperature zones. It is noted, however, that Sarraf does teach the use of separate heaters to control the temperature of a vaporizer and a molten metal hollow reservoir. Furthermore, it would have been obvious to provide another separate heater for a hollow transport tube as claimed because Bennet and Mercer teach that a hollow

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transport tube that is intended to transport molten metal should be heated to prevent the molten metal from undesirably solidifying.

Regarding the use of a thermocouple to control the temperature of a heater, Bennet and Mercer teach that a thermocouple can be used to control the temperature of a heater. In view of this teaching, it would have been obvious to one skilled in the art use a thermocouple as the thermal sensor 38 of Sarraf (see the Fig. and also col. 3, lines 47-49 of Sarraf). Furthermore, Sarraf teaches (see col. 3, lines 23-28) that it is desirable for the temperature of the molten metal reservoir 12 to be accurately maintained. Since Sarraf desires for his molten metal reservoir temperature to be accurately maintained, and Bennet and Mercer teach that a thermocouple can be used to accurately maintain the temperature of molten metal, then it would have been obvious to one skilled in the art to modify the apparatus of Sarraf by providing Sarraf's reservoir 12 with a thermocouple to ensure accurate temperature control of the reservoir 12 as desired by Sarraf.

Applicant has argued that neither Bennet nor Mercer teach controlling three temperature zones. As noted above with respect to Sarraf, however, applicant has attacked the Bennet and Mercer individually where the rejections are based on combination of references. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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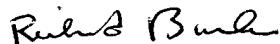
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Richard Bueker
Primary Examiner
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